

REMARKS

Applicants respectfully request that the Examiner convert the present Final Office Action mailed 09/21/2004 to a Non-final office Action, because the Examiner introduced new grounds for rejecting the claims, not necessitated by Applicants' claim amendments, as follows.

The Examiner introduced a new ground for rejecting of claim 3 under 35 U.S.C. §112, first paragraph, wherein said new ground was not necessitated by Applicants' amendment of the claims

The Examiner introduced a new ground in rejecting claim 20 under 35 U.S.C. §103(a) as allegedly unpatentable over Ishii in view of Ting, by alleging for the first time that the insulator layer of claim 20 is represented by the insulator layer 8 of Ishii. The Examiner's introduction of insulator layer 8 of Ishii is responsive to the argument presented in Applicants' prior Office Action response that the Examiner did not present any argument relating to the "insulator layer" feature of claim 20. Therefore, the Examiner's present introduction of the insulator layer 8 of Ishii in response to the argument presented in Applicants' prior Office Action response constitutes a new ground of rejection not necessitated by Applicants amendment of the claims.

Accordingly, Applicants respectfully request that the Examiner convert the present Final Office Action mailed 09/21/2004 to a Non-Final Office Action.

The Examiner allowed claims 10 and 11. Applicants gratefully acknowledge the Examiner's indication of allowable subject matter.

The Examiner objected claims 29-31 and 33 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims. In response, Applicants have so rewritten claims 29, 30, and 33 in independent form.

The Examiner rejected claims 2-3 and 21-22 under 35 U.S.C. §112, first paragraph.

The Examiner rejected claims 1, 3, 4, 8 and 34 under 35 U.S.C. §103(a) as allegedly being unpatentable over Inoue et al. (US Pat. 6,407,442) previously applied, in view of Ting (US Pat. 5,838,032) previously applied.

The Examiner rejected claims 1, 3, 4, 6, 32 and 34 under 35 U.S.C. §103(a) as allegedly being unpatentable over Natsume (US Pat. 5,356,826) previously applied, in view of Ting (U.S. Pat. 5,838,032) previously applied.

The Examiner rejected claims 20, 22, and 24-25 under 35 U.S.C. §103(a) as allegedly being unpatentable over Ishii (US Pat. 6,627,936) previously applied, in view of Ting (U.S. Pat. 5,838,032) previously applied.

The Examiner rejected claim 27 under 35 U.S.C. §103(a) as allegedly being unpatentable over Ishii (US Pat. 6,627,936) previously applied, in view of Ting (U.S. Pat. 5,838,032) previously applied, as applied to claim 20 above, and further in view of Inoue et al. (US Pat. 6,407,442) previously applied.

Applicants respectfully traverse the §112 and §103 rejections with the following arguments.

35 U.S.C. §112, First Paragraph

The Examiner rejected claims 2-3 and 21-22 under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner argues: "Claims 2 and 21, the phrase "a first interconnect connected to one of the top surface, the first side surface, and the second side surface of the Fin structure" is not described in the specification and the figure. Since the specification and the drawing show that Fin structure is a layer (206) and layer (212) is a conductor structure."

In response, Applicants refer to the originally filed claim 2 which recites: "The capacitor of claim 1, further comprising at least one first interconnect disposed adjacent one of the top surface, the first side surface, and the second side surface of the at least one Fin structure."

Moreover, Applicants refer to Paragraph 57 of the specification, which recites: "Continuing with step 112, interconnects, contacts, wiring layers (located above the device level), etc. may then be produced in metallization steps known in the art. Accordingly, sources, drains, and electrodes may be contacted by way of a local interconnect(s) where, for example, interconnects may be disposed adjacent conductor layer 212 portions, and/or interconnects may be disposed adjacent the top surfaces, the first side surfaces, and/or the opposing second side surfaces of the sources or drains (doped exposed portions of the Fins)" (emphasis added). Accordingly, the preceding evidence demonstrates that Applicants had possession of the claimed invention at the time the application was filed with respect to claims 2 and 21.

Applicants respectfully contend that the Examiner's statement that "Fin structure is a

layer (206) and layer (212) is a conductor structure" does not demonstrate that Applicants did not have possession of the claimed invention with respect to claims 2 and 21. In contrast, Applicants' explicit quotation from the specification unambiguously demonstrates that Applicants most certainly did have possession of the claimed invention with respect to claims 2 and 21.

35 U.S.C. §103(a): Claims 1, 3, 4, 8, and 34

The Examiner rejected claims 1, 3, 4, 8 and 34 under 35 U.S.C. §103(a) as allegedly being unpatentable over Inoue et al. (US Pat. 6,407,442) previously applied, in view of Ting (US Pat. 5,838,032) previously applied.

Applicants respectfully contend that claim 1 is not unpatentable over Inoue in view of Ting, because Inoue in view of Ting does not teach or suggest each and every feature of claim 1. For example, Inoue in view of Ting does not teach or suggest the feature "said insulator structure comprising a **single insulative material** distributed from the top surface of the Fin structure to a bottom surface of the conductor structure" (emphasis added).

The Examiner's argument identified the insulator structure 144. In response, Applicants contend that no such insulator structure 144 is disclosed in Inoue. Therefore, the Examiner has not established a *prima facie* case of obviousness in relation to claim 1, since the Examiner's argument with respect to the insulator structure of claim 1, since Applicants cannot reasonably comprehend the Examiner's argument.

Applicants note that Inoue identifies an insulating film 104. Inoue does not teach or suggest, however, that the insulating film 104 comprises a **single insulative material** distributed from the top surface of the Fin structure to a bottom surface of the conductor structure, as required by claim 1. Although the insulating film 104 appears in FIG. 2 of Inoue, FIG. 2 does not show the material composition of the insulating film 104. Moreover, Inoue does not provide any information in the text as to the material composition of the insulating film 104 and how said material composition of the insulating film 104 is distributed from the top surface of the Fin

structure to a bottom surface of the conductor structure. For example, it is within the scope of Inoue's disclosure for the insulating film 104 to consist of multiple insulating materials (e.g., layers or sub-layers) such that no single insulating material of the multiple insulating materials is distributed from the top surface of the Fin structure to a bottom surface of the conductor structure.

The point is that there is no disclosure in Inoue that the insulating film 104 comprises a single insulative material distributed from the top surface of the Fin structure to a bottom surface of the conductor structure.

In summary, the Examiner has not made an understandable argument with respect to the insulator structure of claim 1, since insulator structure 144 is disclosed in Inoue. Applicants' identification *supra* of the insulating film 104 of Inoue has originated from Applicants and not from the Examiner. Therefore, in order to maintain the rejection of claim 1 as being obvious over Inoue in view of Ting, Applicants request that the Examiner identify a valid insulator structure in Inoue with respect to claim 1.

In addition, Applicants respectfully contend that Inoue in view of Ting does not teach or suggest the feature "said Fin structure including a single-crystal semiconductor material". The Examiner argues that "Ting discloses that the lower electrode (23) can be formed of single-crystal semiconductor material (see col. 4, lines 42-44)."

In response, the Examiner has not provided a persuasive argument for modifying by the alleged teaching of Ting. In particular, col. 4, lines 40-44 of Ting identifies the use of a single-crystal semiconductor material with "electrical isolation of the capacitor array ... achieved

through use of PN junctions rather than field oxide". Since Inoue's invention is not directed to achieving "electrical isolation of the capacitor array ... through use of PN junctions rather than field oxide" in conjunction with the capacitor element 100 of FIG. 2 of Inoue, it is therefore not obvious to modify Inoue with the alleged teaching of Ting.

Based on the preceding arguments, Applicants respectfully maintain that claim 1 is not unpatentable over Inoue in view of Ting, and that claim 1 is in condition for allowance. Since claims 3-4, 8 and 34 depend from claim 1, Applicants contend that claims 3-4, 8 and 34 are likewise in condition for allowance.

In addition with respect to claim 4, the Examiner has not provided an argument as to why it is obvious to modify Inoue by the alleged teaching of Ting with respect to the feature: "wherein the conductor structure includes a conductive material selected from the group consisting of a metal, a metal silicide, and doped polysilicon". Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claim 4.

In addition with respect to claim 34, the Examiner has provided an argument as to why it is obvious to modify Inoue by the alleged teaching of Ting with respect to the feature: "wherein the thickness of the Fin structure is greater than 40 nm". Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claim 34.

35 U.S.C. §103(a): Claims 1, 3, 4, 6, 32, and 34

The Examiner rejected claims 1, 3, 4, 6, 32 and 34 under 35 U.S.C. §103(a) as allegedly being unpatentable over Natsume (US Pat. 5,356,826) previously applied, in view of Ting (U.S. Pat. 5,838,032) previously applied.

Applicants respectfully contend that claim 1 is not unpatentable over Natsume in view of Ting, because Natsume in view of Ting does not teach or suggest each and every feature of claim 1. For example, Natsume in view of Ting does not teach or suggest the feature "said Fin structure including a single-crystal semiconductor material". The Examiner argues that "Ting discloses that the lower electrode (23) can be formed of single-crystal semiconductor material (see col. 4, lines 42-44)."

In response, the Examiner has not provided a persuasive argument for modifying by the alleged teaching of Ting. In particular, col. 4, lines 40-44 of Ting identifies the use of a single-crystal semiconductor material with "electrical isolation of the capacitor array ... achieved through use of PN junctions rather than field oxide". Since Natsume's invention is not directed to achieving "electrical isolation of the capacitor array ... through use of PN junctions rather than field oxide" in conjunction with the capacitor C of FIG. 12 of Natsume, it is therefore not obvious to modify Natsume with the alleged teaching of Ting.

Based on the preceding arguments, Applicants respectfully maintain that claim 1 is not unpatentable over Natsume in view of Ting, and that claim 1 is in condition for allowance. Since claims 3-4, 32 and 34 depend from claim 1, Applicants contend that claims 3-4, 32 and 34 are likewise in condition for allowance.

In addition with respect to claim 6 in relation to the feature "wherein the Fin structure has a height between 10 nm and 160 nm", the Examiner has alleged that "it is not inventive to discover optimal or workable ranges by routine experimentation". In response, Applicants maintain that the Examiner has not provided evidence that the height range of the Fin structure is a result effective variable as required by the holding of *In re Antoine*, 559 F.2d 618, 195 U.S.P.Q. 6 (C.C.P.A. 1977) for a variable allegedly optimizable by routine experimentation. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claim 6.

In addition with respect to claim 34, the Examiner has provided an argument as to why it is obvious to modify Natsume by the alleged teaching of Ting with respect to the feature: "wherein the thickness of the Fin structure is greater than 40 nm". Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claim 34.

35 U.S.C. §103(a): Claims 20, 22, and 24-25

The Examiner rejected claims 20, 22, and 24-25 under 35 U.S.C. §103(a) as allegedly being unpatentable over Ishii (US Pat. 6,627,936) previously applied, in view of Ting (U.S. Pat. 5,838,032) previously applied.

Applicants respectfully contend that claim 1 is not unpatentable over Ishii in view of Ting, because Ishii in view of Ting does not teach or suggest each and every feature of claim 1. For example, Ishii in view of Ting does not teach or suggest the feature "said insulator structure comprising a **single insulative material** distributed from the top surface of the Fin structure to a bottom surface of the conductor structure" (emphasis added).

The Examiner's argument identified the insulator structure 6. Applicants maintain, however, that Ishii does not teach or suggest that the insulator structure 6 comprises a **single insulative material** distributed from the top surface of the Fin structure to a bottom surface of the conductor structure, as required by claim 1. Although the insulator structure 6 appears in FIG. 2 of Ishii, FIG. 2 does not show the material composition of the insulator structure 6. Moreover, Ishii does not provide any information in the text as to the material composition of the insulator structure 6 and how said material composition of the insulator structure 6 is distributed from the top surface of the Fin structure to a bottom surface of the conductor structure. For example, it is within the scope of Ishii's disclosure for the insulator structure 6 to consist of multiple insulating materials (e.g., layers or sub-layers) such that no single insulating material of the multiple insulating materials is distributed from the top surface of the Fin structure to a bottom surface of the conductor structure.

The point is that there is no disclosure in Ishii that the insulator structure 6 comprises a

single insulative material distributed from the top surface of the Fin structure to a bottom surface of the conductor structure.

In addition, Applicants respectfully contend that Ishii in view of Ting does not teach or suggest the feature "said Fin structure including a single-crystal semiconductor material". The Examiner argues that "Ting discloses that the lower electrode (23) can be formed of single-crystal semiconductor material (see col. 4, lines 42-44)."

In response, the Examiner has not provided a persuasive argument for modifying by the alleged teaching of Ting. In particular, col. 4, lines 40-44 of Ting identifies the use of a single-crystal semiconductor material with "electrical isolation of the capacitor array ... achieved through use of PN junctions rather than field oxide". Since Ishii's invention is not directed to achieving "electrical isolation of the capacitor array ... through use of PN junctions rather than field oxide" in conjunction with the capacitor of FIG. 9 of Ishii, it is therefore not obvious to modify Ishii with the alleged teaching of Ting.

Based on the preceding arguments, Applicants respectfully maintain that claim 20 is not unpatentable over Ishii in view of Ting, and that claim 20 is in condition for allowance. Since claims 22 and 24-25 depend from claim 20, Applicants contend that claims 22 and 24-25 are likewise in condition for allowance.

In addition with respect to claim 22, the Examiner has provided an argument as to why it is obvious to modify Natsume by the alleged teaching of Ting with respect to the feature: "further

comprising a second interconnect connected to the conductor structure". Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claim 22.

In addition with respect to claims 24-25 in relation to the features "wherein the thickness of the Fin structure is in a range of 0.3 nm to 40 nm" (claim 24); and "wherein the Fin structure has a height between 10 nm and 160 nm" (claim 25). The Examiner has alleged that "it is not inventive to discover optimal or workable ranges by routine experimentation". In response, Applicants maintain that the Examiner has not provided evidence that the thickness range and height range of the Fin structure are result effective variables as required by the holding of *In re Antoine*, 559 F.2d 618, 195 U.S.P.Q. 6 (C.C.P.A. 1977) for a variable allegedly optimizable by routine experimentation. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claims 24-25.

35 U.S.C. §103(a): Claims 27

The Examiner rejected claim 27 under 35 U.S.C. §103(a) as allegedly being unpatentable over Ishii (US Pat. 6,627,936) previously applied, in view of Ting (U.S. Pat. 5,838,032) previously applied, as applied to claim 20 above, and further in view of Inoue et al. (US Pat. 6,407,442) previously applied.

Since claim 27 depends from claim 20, which Applicants have argued *supra* to not be unpatentable over Ishii in view of Ting under 35 U.S.C. §103(a), Applicants maintain that claims 11-12 are likewise not unpatentable over Ishii in view of Ting and further in view of Inoue under 35 U.S.C. §103(a).

In addition, Applicant's respectfully contend that over Ishii in view of Ting and further in view of Inoue does not teach or suggest the feature: "wherein a FinFET is disposed on the substrate, the FinFET having a gate electrode coupled to said conductor structure", because the Examiner's argument for modifying Ishii by the alleged teaching of Inoue is not persuasive.

The Examiner argues: "Inoue et al. discloses that the FinFET (110 or 111) is disposed on the substrate (101), the FinFET having a gate electrode (105) coupled to said conductor structure (105a) (see fig. 13). Therefore, it would have been obvious to one having skill in the art to include the FinFet disposed on the substrate and the FinFet having a gate electrode coupled to the conductor structure in the Ishii's device in order to operate the device.

In response, Applicants contend that the Examiner's argument to modify Ishii by the alleged teaching of Inoue, namely "in order to operate the device [of Ishii]", has been created by the Examiner and not derived from the prior art. The Examiner has not cited any prior art

demonstrating that Ishii's device should be modified as recited in claim 27 "in order to operate the device".

Indeed, if it were necessary to couple the FinFET to the conductor structure in order to operate the device of Ishii, it would be impossible to operate the device in FIG. 2 of Inoue and the reference of FIG. 2 of Inoue cited by the Examiner for rejecting claims 1, 3, 4, 8 and 34 would be a non-enabling reference. Thus, the Examiner's argument leads to the conclusion that FIG. 2 of Inoue is a non-enabling reference.

In any event, the Examiner has not established from the prior art that it is obvious to incorporate the FinFET of claim 27 in Ishii's device in order to operate Ishii's device.

In summary, case law requires that the Examiner must back up arguments for combining references by citations to the prior art which the Examiner has not done. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness in relation to claim 27.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0456.

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